

Livestock flies - Sw

RC Bushand

JUN 22 1956

P. O. Box 3391
Orlando, Florida
June 19, 1956

AIRMAIL

Mr. Ed Kendra
Chemical Engineer
Fort Detrick, Maryland

Dear Ed:

Through C. L. Smith

Following are data on production of the eggling stock (in progress during your recent visit) for the Bithlo operation. Progeny of the best fathers of the fifth selection in Series A of the mating tests were combined as pupae, placing 20 cc. each of four selected cultures in holding cages. Flies from these groups were egged on the 8th day, with three cages yielding 6.2 gm. of eggs or an estimated 124,000 eggs. Using a factor of 7.2 ($7.2 \times 80 \text{ cc.} = 576$), an estimated 576 flies or 288 females were contained in each cage, giving an average of 144 eggs per female.

Six grams of eggs were divided into 12 lots of 500 mg. and started in cake pans 9 inches in diameter. The following table contains data on quantity of medium provided at indicated time.

JUN 2 1956

P. O. Box 3391
Orlando, Florida
June 19, 1956

AIRMAIL

Mr. Ed Kandra
Chemical Engineer
Fort Detrick, Maryland

Through C. L. Smith

Dear Ed:

Following are data on production of the laying stock (in progress during your recent visit) for the Bilio operation. Progeny of the best fathers of the fifth selection in Series A of the mating tests were combined as pupae, placing 50 cc. each of four selected cultures in holding cages. Flies from these groups were egged on the 8th day, with three cages yielding 6.2 gm. of eggs or an estimated 124,000 eggs. Using a factor of 7.2 (7.2 x 50 cc. = 276), an estimated 276 flies or 288 females were contained in each cage, giving an average of 114 eggs per female.

Six grams of eggs were divided into 12 lots of 500 mg. and started in cake pans 9 inches in diameter. The following table contains data on quantity of medium provided at indicated time.

2-Ed Kendra-6/19/56

Quantity of media provided at indicated time for 12 units of
10,000 screw-worm larvae:

Time	: Age of larvae : : in hours	: Container	: No.	: Quantity of : : media in cc.	: Total
02:00-6/9	0	9" dia. cake pan	12 _{1/}	350	4,200
09:00-6/10	31	17" x 26" tray	6 _{2/}	2,500	15,000
09:00-6/11	55	do.	6	2,000	12,000
20:00-6/11	66	do.	12	2,000	24,000
11:00-6/12	81	do.	12	1,800 _{2/}	21,600
22:00-6/12	92	do.	12	1,800 _{2/}	21,600
				Total	98,400

1/ Larvae from 2 cake pans transferred to each of 6 trays, then subdivided at 66 hours to 12 trays.

2/ Equals average quantity per pan; actual amount varied due to inaccuracy of subdivision.

Experience in rearing this culture of screw-worms supports your opinion that subdivision of larvae from one container to several would introduce undesirable variations in the number of larvae per container, complicating handling of trays in the production line. Instead of doubling the number of larvae per container at 24 or 30 hours, the answer would seem to be an intermediate size tray for the second day of growth, then transferring to the larger tray. As noted in the preceding table, addition of media was made at intervals as short as 11 hours. This was due partly to necessity and partly to minimize returning to the laboratory at odd hours. However, with the present number of larvae being reared per pan, it will be necessary to add media this frequently during the later stages of rapid larval growth.

The following table includes data on the quantity of larvae completing feeding and pupating at indicated time:

3-24 Kandra-6/19/56

Quantity of media provided at indicated time for 12 units of 10,000 screw-worm larvae:

Time	in hours	Container	No.	Media in cc.	Quantity of
02:00-6/19	0	9" dia. cake pan	12	350	14,300
09:00-6/19	31	17" x 26" tray	6	2,500	15,000
09:00-6/11	22	do.	6	2,000	12,000
20:00-6/11	66	do.	12	2,000	24,000
11:00-6/12	81	do.	12	1,800	21,600
22:00-6/12	92	do.	12	1,800	21,600
Total					98,100

1/ Larvae from 2 cake pans transferred to each of 6 trays, then subdivided at 66 hours to 12 trays.
 2/ Equals average quantity per pan; actual amount varied due to inaccuracy of subdivision.

Experience in rearing this culture of screw-worms supports your opinion that subdivision of larvae from one container to several would introduce undesirable variations in the number of larvae per container, complicating handling of trays in the production line. Instead of doubling the number of larvae per container at 24 or 30 hours, the answer would seem to be an intermediate size tray for the second day of growth, then transferring to the larger tray. As noted in the preceding table, addition of media was made at intervals as short as 11 hours. This was due partly to necessity and partly to minimize returning to the laboratory at odd hours. However, with the present number of larvae being reared per pan, it will be necessary to add media this frequently during the later stages of rapid larval growth.

The following table includes data on the quantity of larvae completing feeding and pupating at indicated time:

3-Ed Kendra-6/19/56

Quantity of larvae completing feeding and pupating at indicated time:

Group	: Range in age : : of larvae : : in hours :	Time		: Quantity of : : pupae in cc. :	: Total
		: Larvae off	: Pupated		
A	84-92	14:00 to 22:00 6/12	22:00 6/12 to 22:00 6/13	300	300
B	92-103	22:00 6/12 to 09:00 6/13	9:00 6/13 to 22:00 6/13	1,950	
			22:00 6/13 to 09:00 6/14	1,910	
			09:00 6/14 to 22:00 6/14	170	4,030
C	103-109	09:00 6/13 to 15:00 6/13	15:00 6/13 to 09:00 6/14	1,550	
			09:00 6/14 to 22:00 6/14	30	1,580
D	109-127	15:00 6/13 to 09:00 6/14	15:00 6/13 to 09:00 6/14	420	
			09:00 6/14 to 22:00 6/14	550	
			22:00 6/14 to 08:00 6/15	140	1,110
				Total	7,020

Since this culture averaged 8.5 pupae per centimeter, the 7,020 cc. of pupae contain an estimated 59,670 individuals, slightly less than 50% recovery from the estimated 120,000 eggs.

3-Bd Kendra-6/13/56

Quantity of larvae completing feeding and pupating at indicated times:

Group	Range in age	: of larvae	: in hours	: Pupated	: pupae in co.	: Total
A	81-92	11:00 to 22:00 6/13	22:00 6/13	300	300	300
B	92-103	02:00 6/13 to 22:00 6/13	22:00 6/13	1,250	1,250	1,250
		02:00 6/13 to 09:00 6/13	09:00 6/13	1,250	1,250	1,250
		09:00 6/13 to 22:00 6/13	22:00 6/13	1,030	1,030	1,030
C	103-109	02:00 6/13 to 12:00 6/13	12:00 6/13	1,250	1,250	1,250
		12:00 6/13 to 02:00 6/14	02:00 6/14	30	30	1,280
D	109-127	12:00 6/13 to 02:00 6/14	02:00 6/14	1,250	1,250	1,250
		02:00 6/14 to 22:00 6/14	22:00 6/14	340	340	1,590
		22:00 6/14 to 02:00 6/15	02:00 6/15	1,110	1,110	1,110
				Total	7,020	7,020

Since this culture averaged 8.5 pupae per centimeter, the 7,020 cc. of pupae contain an estimated 59,670 individuals, slightly less than 50% recovery from the estimated 120,000 eggs.

4-Ed Kendra-6/19/56

Of the 98,400 cc. of media used, an estimated 10,000 cc. was not utilized. Using the figure 98,400, each larva required 1.48 cc. of media. This figure is more realistic than 1.0 cc. per larvae obtained with the use of concentric pans which though more efficient had the decided disadvantage of limiting the rate of growth and the size of larvae produced due to the tendency of the larvae to remain too long in used media. Recent experience indicates the importance of accurately relating the depth of medium to size of larvae to increase efficiency, although more frequent treatment of the containers will be necessary than with greater depths of media.

Very truly yours,

A. H. Baumhover

A. H. Baumhover

AHBaumhover

cc. A. W. Lindquist
R. C. Bushland ✓

14-14 Kenda-6/12/50

of the 98,400 cc. of media used, an estimated 10,000 cc. was not utilized. Using the figure 88,400, each larva required 1.5 cc. of media. This figure is more realistic than 1.0 cc. per larvae obtained with the use of concentrated pans which more efficient had the decided disadvantage of limiting the rate of growth and the size of larvae produced due to the tendency of the larvae to remain too long in used media. Recent experience indicates the importance of accurately relating the depth of medium to size of larvae to increase efficiency, although more frequent treatment of the containers will be necessary than with greater depths of media.

Very truly yours,

A. H. Bannover

A. H. Bannover

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cc. A. W. Lindquist
R. C. Ireland ✓